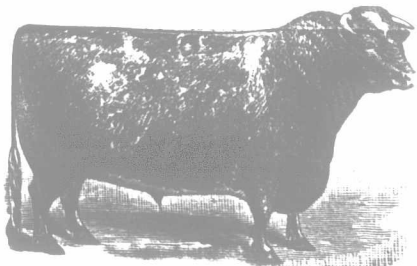


**Laying Tile Drains.**

T. B. Terry, in the Practical Farmer, offers the following pointers on laying tile drains:

The first thing is to lay out the system. Get a board, straightedge, about six inches wide and ten feet long. Nail a strip about three feet long at right angles at the middle of the straightedge. Sharpen lower end of strip so it will go in the ground easily. Then with a carpenter's level and a measuring pole you are ready to find the difference in level between any points in your fields. Never trust the eye where there is any possibility of lack of fall. The level will tell you certainly. Get the straightedge at the highest point by sticking the sharpened end of crosspiece in the ground. Vary it until the level shows it to be just level. Then send a man with a pole to the lowest point, the outlet. Sight along top of straightedge, which should be in line with pole, until you get the point on pole which is level with straightedge. Have a white cloth around pole which man can move until right. Suppose this cloth is seven feet from the ground and the top of straightedge is three feet high. Then the difference between seven and three, four feet, will be the fall between the two points. With a little care you can do quite perfect work finding the lowest point for a main outlet, and the amount of fall for each drain. Then when you begin to dig you know just what you can do. If a drain must go through a rise in ground set the straightedge at the highest point and level both ways. With your levelling done you can plow and shovel partly, digging last course with a spade. The final grading for the tiles I should do with water, in any ordinary case. It is only necessary to remember that water will run down hill. The time to do draining is when there is water in the ground. Get the bottom of ditch so water will run uniformly from end to end before you put the tiles in, and it will flow the same inside of them after they are placed. Isn't that simple? I never laid a drain without first knowing myself that water would so run. Sometimes in the spring, before we got quite done, there would be some little ditches that were dry. For these I drew water in barrels on a stone boat. As the bottom of ditches is clay, and a groove in that to place tiles in, but little water is needed to test the grade. If any points were too high, so water did not flow over, I cut them down with the scoop until it would. I say I did it, for I never once trusted anyone else to finish such work. The future usefulness of each drain depended on having a proper grade so the water would all flow out of the tiles, with no low places for sediment to settle in. During all the years since we have never had any trouble with these drains. It is a serious mistake to half-do tile-draining, and have the work to do over in a few years. Having the grade right, there are several other matters of vital importance to attend to. First, see that every tile you lay is hard enough to stand and has nothing inside of it to stop the flow of water. I never laid a tile that would not ring clear when struck against another. Soft tiles that would stake by frost if left on top of ground we never used. Glazed tiles, made of sewer-pipe clay, are good. And so are those made of brick clay, if burned hard enough. Do not put in one poor tile. It may make you much trouble. And do not lay a single tile in a drain so it is possible for it to move sideways, or up and down after you have placed it. Either have the bottom of the ditch just the width of the tiles to be laid, or, if wider, have a groove cut for tiles to lie in, so they will be held firmly in their places. I want tiles laid so one can walk all along on top of them without displacing one. Then they are safe. I always laid the tiles as tightly together as possible. If one did not fit closely, making a fairly tight joint, I would turn it until it did, or try another tile. Well-burned tiles are not apt to be perfectly true in shape. I never feared getting them too tight together. Sometimes on a curve it was not possible to make a reasonably tight joint; then the crack was covered with pieces of larger tiles, or flat stones, so as to keep the earth from going in. And the same care was taken where side drains came into a main. I never had any fears about the water not getting in, when the best fitting that was practicable



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was done. For that matter, water will go through a brick-clay tile, and it will freely work into the numerous small cracks between the tiles. But now I have been told by some prairie farmers, who use tiles that are burned so lightly that they are very perfect in shape, that when they are laid tightly together they will swell so water cannot get in. It doesn't seem possible to me that water could be shut out of a drain in this way. There must be marvellous perfection in tile-making and laying when joints fit watertight. Now, you have good tiles laid in a groove that will hold them in place, and so water can flow through them without any low places. There are two more important matters to attend to. One is putting the first few inches of earth over the tiles. It should be clay from near the bottom of the ditch, not surface soil. But the clay that you have thrown out with spade is apt to be in chunks and hard. It is in poor shape to put directly on the tiles. My way always was to walk along the ditch and shave off clay thinly on both sides of ditch, from near the bottom, with a sharp spade, letting it fall right on the tiles. One can do this work quite fast. And this clay will be moist, freshly dug, and, being shaved thinly, it can be packed closely without trouble. After the clay was shaved down I walked on it, one foot each side of tiles part of the time, packing the fine clay firmly over and about them. This first filling should be at least three or four inches deep. I would pack it watertight, if possible. Water should never go down into the tiles from the surface directly. You should prevent it doing so, if possible. With it would go sediment to fill your drains and fertility from the soil. Hence the importance of fine clay packed tightly over the tiles at first. Rain water should soak down into the earth evenly all over. When the water table, as it is called—that is, the standing water in the ground—raises as high as the tiles it will work up into them and pass out. And this is just what it should do always. So if tiles do not make perfect joints, let the top be tight to keep clay out, and the bottom slightly open to let water in. Never think of putting straw, or sods, or anything over tiles but clay, if it is there. It is a mistake to let water in from above. After this first filling is thoroughly packed, anyone can do the rest of the job. The vital points are good grading for the tiles and all good tiles, snugly laid and covered so not one can move, or be broken in filling. This part of the work the owner should see to. I have sometimes trusted men to do grading, but I went over it myself before laying the tiles. Not a single tile was laid by other hands than mine. I do not mean that hired men may not be as careful as anyone, but the boss should know his business and see to it. I could tell plenty of costly experiences that have come to friends who paid no attention to how ditchers did the work. There has been much poor, careless work done in tile-draining. This has set back the good work, because many concluded that a lasting job could not be done. The ditchers would talk as though they knew all about the matter, of course, and often they didn't, and the farmer suffered. The owner of a farm should learn and know just what should be done and then see to it that it is. Drains properly put in are for all time, practically. There isn't the slightest need of their filling up. Now, lastly, when the draining is done you need to fix a good outlet to each main. Have as few outlets as you well can, as they are a bother at the best. Better to collect several drains into one main, than to have a number of outlets to care for. Mason work can be laid so as to make a permanent outlet if you go below frost, but it is an expensive job. A good, inexpensive plan is to use sewer pipe, with sockets or collars, for a few feet near the end of main. These cannot be misplaced by frost readily. Then sod over the bank all around. A heavy sod will not wash away readily, and will rise and fall with frost, same as the sewerpipes do. These pipes, with sockets or collars, should be used as far back as the drain is shallow so frost can get below it. Close the upper end of each drain with a stone. Water should not run directly in. A screen over the outlet to keep small animals out is a good thing. Or you can hang a little board by hinging at the top to a frame so it will rise to let water out, dropping back as the flow goes down.

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